Amendments to the Specification:

Please replace paragraph [0071] with new paragraph [0071], shown below

[0057] The flexible link **190**, in general, functions as a leaf spring. When the carriage **160** travels away from the wafer **12**, for example, the carriage **160** pulls the center **191** of the flexible link **190** away from the wafer **12** and rotates the gripper arms **200** into the wafer-engaging position (Fig. 4). The flexible link **190** compensates for any amount of wafer offset so that, for example, both gripper arms **200** ~~and 202~~ engage the wafer **12** even if the wafer is not centered on the wafer blade **111**. The flexible link **190** also prevents overloading of the drive mechanism **144** if an operator manually inserts a wafer of the wafer blade **111**.

Please replace paragraph [0051] with new paragraph [0051], shown below

[0051] The motor assembly **144**, through the cam **150**, drives the carriage **160** ~~150~~. Any motion by the cam **150** preferably imparts motion to the carriage **160**. The end of cam travel (*e.g.*, cam **150** is located at 0° or 180° degrees), however, may allow a couple degrees of cam motion to translate into no linear motion of the carriage **160**. The cam **150**, in other words, is not doing useful work during some portion. If the cam **150** is allowed to rotate completely to the 0° or 180° position (defined as an "overtravel" position), the cam **150** further may jam or the end effector **100** will lose track of the precise location of the carriage **160**.

Please replace paragraph [0064] with new paragraph [0064], shown below

[0001] The force sensing device **228** provides real-time data to the motor assembly **144** so that the end effector can determine immediately of there is a malfunction. If, for example, the gripper arms **200** attempt to grip the wafer **12** and a wafer **12** is not present on the wafer blade **111**, or the wafer **12** slips on the wafer blade **111**, the position of motor **146** (as determined by the Hall-effect sensors) will indicate that the gripper arms **200** missed the wafer **12** and moved too ~~to~~ far. If, on the other hand, the wafer **12** pops off the support pads **126**, the amount of force measured by the force sensing device **228** will drop immediately and indicate to the end effector that a malfunction has occurred. The thru-beam sensors **222** and **224**, in addition the force sensing device **228**, also detects the edge of a wafer **12**. In general, the force sensing device **228** and the optical sensors provide a double check system to detect a wafer **12** on the wafer blade **111**.

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) An end effector adapted to grip a peripheral edge of a workpiece, comprising:

a workpiece blade for supporting a workpiece;

a first gripper arm and a second gripper arm each operatively mounted to said workpiece blade, said first and second gripper arms each including a contact pad;

means for moving said first and second gripper arms between a workpiece-loading position and a workpiece-engaging position, ~~where~~ said contact pads contacting ~~contact~~ the peripheral edge of the workpiece and exerting ~~exert~~ a force on the workpiece when said first and second gripper arms are located in said workpiece-engaging position; and

means for dynamically adjusting the force exerted by the first and second gripper arms on the workpiece after ~~while~~ said first and second gripper arms are located in said workpiece-engaging position.

2. (Cancel)

3. (Original) The end effector according to claim 1, wherein said first and second gripper arms further include a force sensing device adapted to measure the force said contact pads exert on the workpiece.

4. (Original) The end effector according to claim 1, wherein said contact pads further include sensors adapted to detect the edge of the workpiece.

5. (Original) The end effector according to claim 4, wherein said sensors comprise thru-beam sensors.

6. (Original) The end effector according to claim 1, wherein said means for moving said first and second gripper arms comprises a motor assembly that is operatively coupled with said first and second gripper arms.

7. (Original) The end effector according to claim 6, wherein said motor assembly includes:

a brushless motor having an output shaft;

a planetary gear having a first end coupled to said output shaft and a second end having a shaft extending outward from said planetary gear that rotates slower than said output shaft;

a cam coupled to said shaft, said cam having a geometrical center that is offset from the rotational center of said shaft;

a carriage having a drive slot adapted to receive said cam; and

a flexible link having a central portion adapted to secure to said carriage, a first and end adapted to secure to said first gripper arm, and a second end adapted to secure to said second gripper arm.

8. (Original) The end effector according to claim 7, further comprising a real-time force feedback system, including:

a force sensing device secured to each one of said contact pads, each force sensing device adapted to generate an electrical signal representing the amount of force being exerted against the workpiece; and

a processor adapted to receive said electrical signal from each said force sensing device and sending an electrical signal to said brushless motor in order to adjust the position of said first and second gripper arms.

9-16. (Withdrawn)

17. (Currently Amended) An apparatus for handling wafers, comprising:

a wafer blade for supporting a wafer;

a first contact arm and a second contact arm each operatively mounted to said wafer blade, said first and second contact arms each having a contact pad adapted to contact a peripheral edge of the wafer;

a motor assembly operatively connected to said first and second contact arms, said motor assembly for moving said first and second contact arms between a wafer-loading position that allows a wafer to be loaded onto said wafer blade and a wafer-engaging position where each said contact pad contacts the peripheral edge of the wafer and exerts a force on the wafer;

a force sensing device for measuring ~~adapted to measure~~ the amount of force each said contact pad exerts against the peripheral edge of the wafer; and

a force feedback system electrically coupled to ~~each~~ said force sensing device and said motor assembly, said force feedback system ~~adapted to control~~ controlling the operation of said motor assembly based at least in part on the amount of force measured by said force sensing device.

18. (Original) The apparatus according to claim 17, wherein said force sensing device measures the force said contact pads exert on the wafer in real-time.

19. (Currently Amended) The apparatus according to claim 17, wherein each said contact pad further includes sensors adapted to detect the edge of the wafer ~~before said contact pad contacts the peripheral edge of the wafer~~.

20. (Original) The apparatus according to claim 17, wherein said force sensing device comprises a load cell.

21. (Original) The apparatus according to claim 17, wherein said force sensing device comprises a strain gauge.

22-23. (Withdrawn)

24-26. (Cancel)

27. (Withdrawn)

28-32. (Cancel)

33-35. (Withdrawn)